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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/615,089	<b>Applicant(s)</b> JIN ET AL.
	<b>Examiner</b> Janis L. Dote	<b>Art Unit</b> 1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 29 October 2007.
- 2a) This action is FINAL.      2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-13,15-51 and 53-86 is/are pending in the application.
- 4a) Of the above claim(s) 1-13,15,26,40-51,53 and 63 is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 16-25,27-39,54-62,64-80 and 83-86 is/are rejected.
- 7) Claim(s) 81 and 82 is/are objected to.
- 8) Claim(s) 1-13, 15-51, and 53-86 are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_
- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date \_\_\_\_\_
- 5) Notice of Informal Patent Application
- 6) Other: \_\_\_\_\_

1. A request for continued examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicants' submission filed on Oct. 29, 2007, has been entered.

2. The examiner acknowledges the amendments to claims 16 and 54 filed on Aug. 13, 2007, which were entered on the filing of the RCE. Claims 1-13, 15-51, and 53-86 are pending.

The examiner also acknowledges the amendment to the specification filed on Jul. 16, 2007, which was entered on the filing of the RCE.

3. The "Listing of claims" filed on Aug. 13, 2007, replaces in entirety that filed on Jul. 16, 2007.

However, that "Listing of claims" did not comply with 37 CFR 1.121 for the reasons discussed in the Advisory action mailed on Aug. 27, 2007. See the attachment to the Advisory action, paragraph 2.

Nonetheless, in the interest of compact prosecution, the

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"Listing of claims" filed on Aug. 13, 2007, has been entered and replaces all prior versions and listings of claims in the instant application.

If claims 16, 37, and 54 are not further amended, in reply to this office action, applicants should file a proper "Listing of claims" where the text in claims 16, 37, and 54, labeled as "previously filed," is presented in "clean version," i.e., without any markings in the presentation of the text.

4. Applicants' election without traverse of the invention of Group II, which now include claims 16-39 and 54-86, and the elected species identified in the reply filed on Oct. 24, 2005, were acknowledged in the office action mailed on Jan. 12, 2006, paragraphs 1 and 2.

Claims 1-13, 15, 26, 40-51, 53, and 63 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention and nonelected species of invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on Oct. 24, 2005.

5. The objections to the specification set forth in the office action mailed on Mar. 14, 2007, paragraphs 6 and 8, have been

withdrawn in response to the amended first full paragraph at page 11 of the specification, filed on Jul. 16, 2007, and to the amendment to claim 54, filed on Aug. 13, 2007, which were entered on the filing of the RCE.

The objections to the specification set forth in the office action mailed on Mar. 14, 2007, paragraph 7, have been withdrawn in response to the amended paragraphs at pages 11, 34, 40, and 41 of the specification, filed on Jul. 16, 2007, which was entered on the filing of the RCE.

The rejections of claims 16-32 and 54-86 under 35 U.S.C. 112, first paragraph, set forth in the office action mailed on Mar. 14, 2007, paragraph 10, have been withdrawn in response to the amendments to claims 16 and 54 filed on Aug. 13, 2007, which were entered on the filing of the RCE.

The rejections of claims 16, 17, 22-25, and 27-39, 54, 55, 59-62, 64-73, 75-80, and 83-86 under 35 U.S.C. 102(e)/103(a) over US 6,495,300 B1 (Qi) set forth in the office action mailed on Mar. 14, 2007, paragraphs 12 and 13, respectively, have been withdrawn in response to applicants' arguments filed on Jul. 16, 2007, page 32, that the Qi vinylcarbazole monomer does not comprise the tertiary arylamine charge transport moiety, A, as required in instant claims 16 and 54.

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6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 16-19, 22-25, 27-39, 54-56, 59-62, 64-80, and 83-86 are rejected under 35 U.S.C. 103(a) as unpatentable over US 6,495,300 B1 (Qi), as evidenced by (1) applicants' admissions at page 24, lines 17-20, and page 40, lines 8-14 of the originally filed specification (Applicants' admission I), (2) US 4,647,521 (Oguchi), (3) US 3,923,485 (Franz), (4) US 5,930,090 (Beaurline), and (5) US 4,082,710 (Vrancken); combined with US 5,427,880 (Tamura), as evidenced by Diamond, Handbook of Imaging Materials, p. 426, and Fig. 9.22 at page 430 (Diamond) and US 6,376,695 B1 (Kushibiki).

Qi discloses an electrophotographic photoconductive imaging element comprising an electrically conductive layer, a barrier layer, a photogenerating layer (also known in the electrophotographic arts as a charge generating layer), a charge transporting layer, and an overcoat layer comprising a crosslinked composite polysiloxane-silica. The crosslinked composite polysiloxane-silica is obtained by reacting 0.56 g of the silyl-functionalized hydroxyalkyl polymer of Formula (IV-a), 0.24 g of the organosilane compound 3-aminopropyltrimethoxy-silane, and 0.016 g of hydrophilic silica particles sold under

the tradename AEROSIL 200 obtained from Degussa in a mixture of ethanol/water. The overcoat layer has a layer thickness of about 5 microns. See col. 16, lines 62-67, and example VI at cols. 22-23. The polymer of formula (IV-a) comprises 0.02 mole fraction of the monomer 3-(trimethoxysilyl)propylmethacrylate and 0.10 mole fraction of a vinyl-containing monomer comprising a hole transporting moiety, e.g., vinylcarbazole. See col. 5, lines 17-18, formula (IV-a) at col. 12, and example 1 at cols. 19-20.

According to Qi, the electrophotographic imaging member comprising an overcoat layer comprising the crosslinked composite polysiloxane-silica provides satisfactory imaging performance and has excellent mechanical wear resistance characteristics. Col. 4, lines 40-43 and 55-59. The overcoat layer has excellent adhesion to the charge transport layer. Col. 4, lines 60-64.

Qi does not identify its crosslinked composite as a silsesquioxane as recited in the instant claims. However, the instant specification at page 40, lines 8-14, provides a structure of a silsesquioxane. The Qi crosslinked composite has the structure shown in Formula (V) at col. 9, which is similar to that shown at page 40 of the instant specification.

Accordingly, it is reasonable to conclude that the Qi

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crosslinked composite is a silsesquioxane as recited in the instant claims. The burden is on applicants to prove otherwise.

In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

Qi does not identify its overcoat layer as a charge transport layer as recited in instant claim 54. However, as discussed above, the Qi crosslinked composite is obtained from the silyl-functionalized hydroxylalkyl polymer of Formula (IV-a), that comprises vinyl-containing monomer units comprising a "hole transporting moiety," e.g., vinylcarbazole. Thus, it is reasonable to conclude that the Qi overcoat layer has charge transporting properties. The burden is on applicants to prove otherwise. Fitzgerald, supra. Accordingly, the placement of the respective layers, i.e., barrier layer, photogenerating layer, charge transporting layer, and overcoat layer, in the Qi photoconductive imaging member meets the layer arrangement limitations recited in instant claims 54, 75, 80, and 83.

The Qi overcoat layer thickness of "about 5 microns" is within the layer thickness ranges recited in instant claims 84 and 86. The Qi overcoat layer thickness of "about 5 microns" is also within the layer thickness range of "about 1 micron to about 3 microns" (emphasis added) recited in instant claim 85. The term "about" admits variation. There is no disclosure in the instant specification of critical properties that exclude

the Qi overcoat layer thickness of about 5 microns from the upper limit of "about 3 microns" of the layer thickness range recited in instant claim 85. Thus, the Qi layer thickness of about 5 microns is within the layer thickness range recited in instant claim 85.

As discussed above, the Qi silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) comprises 0.02 mole fraction of the monomer (3-trimethoxysilyl)propylmethacrylate and 0.10 mole fraction of the hole-transporting moiety-containing monomer. That silyl-containing monomer is applicants' elected species, methacryloxypropyltrimethoxsilane (MATMS), and therefore also meets the compositional limitations of the silyl-containing monomer recited in instant claims 16, 17, 22, 27-29, 54, 55, 59, and 64-66. The 0.02 mole fraction of Qi's MATMS is within the silyl-containing monomer mole fraction "b" range of "about 0.99 to about 0.01" recited in instant claims 16 and 54. The 0.10 mole fraction of the Qi vinyl-containing monomer comprising a hole transporting moiety is numerically within the charge transport moiety-containing monomer mole fraction "a" ranges of "about 0.01 to about 0.99" recited in instant claims 16 and 15, and of "about 0.01 to about 0.9" recited in instant claims 23 and 60. The sum of the Qi mole fractions 0.02 and 0.10 is 0.12, which is within the

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mole fraction sum (a + b) range of 1.00 or less recited in instant claims 16 and 54. Qi further teaches that the vinyl-containing monomer comprising a hole transporting moiety may be present in mole fractions of from about 0 to about 0.5.

Col. 15, line 39. The upper limit, about 0.5 mole fraction, of the mole fraction of the Qi vinyl-containing monomer comprising a transporting moiety is within the mole fraction (a) ranges recited in instant claims 24, 25, 61, and 62. When the mole fraction of the vinyl-containing monomer comprising a hole-transporting moiety in the Qi silyl-functionalized hydroxalkyl polymer of Formula (IV-a) in example 1 is adjusted to be about 0.5 mole fraction, the sum of the mole fractions 0.02 and about 0.5 would be about 0.52, which is within the sum of the mole fractions range recited in instant claims 16 and 54.

The organosilane compound 3-aminopropyltrimethoxysilane meets the optional silane monomer limitations recited in instant claims 16, 30-33, 54, and 67-71. Qi teaches that the organosilane compound can equally be methyltrimethoxysilane, which meets the optional silane monomer limitations recited in instant claims 34, 35, 72, and 73. Col. 11, line 56. The organosilane compound methyltrimethoxysilane also meets applicants' elected species.

Based on the information provided in example VI of Qi, the

amount of silica particles in the reaction product is determined to be 2 wt% based on the weight of the crosslinked composite polysiloxane-silica. The amount of 2 wt% is within the amount range of "about 5 to about 30 weight percent based on the weight of the silsesquioxane" recited in instant claims 16 and 54. The term "about" admits variation. There is no disclosure in the instant specification of critical properties that exclude the Qi amount of 2 wt% from the lower limit, "about 5 weight percent" recited in instant claims 16 and 54. Thus, the Qi silica particles amount of 2 wt% is within the amount range recited in instant claims 16 and 54.

Qi does not identify the silica particles sold under the tradename AEROSIL 200 obtained from Degussa as "colloidal silica" as recited in instant claims 16 and 54. However, according to Oguchi, which is drawn to electrophotographic photosensitive members, at col. 8, lines 65-68, "[h]itherto used colloidal silica involve aqueous sols using water as a dispersion medium and aerosols using air as a dispersion medium." Silica particles sold under the tradename AEROSIL 200 are well known as "colloidal silica." See Vrancken, col. 22, line 33, which identifies the tradename AEROSIL 200 from Degussa as "colloidal silica"; and Beaurline, col. 3, lines 13-23, which also identifies the tradename AEROSIL 200 obtained from Degussa

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as "colloidal silica," and states that it is used as a gelling agent. Franz also discloses that silica particles, such as the commercially available AEROSIL 200 from Degussa, are produced by high temperature hydrolysis, referred to as fumed or pyrogenic silica, are "colloidal in nature." Col. 3, line 51, to col. 4, line 12. The originally filed specification at page 24, lines 17-20, discloses that the "hydrolysis and condensation of silanes can be catalyzed by adding colloidal silica, i.e., silica particles that are stabilized by either an acidic or basic surface charge, and can influence the mechanical properties of the resulting silsesquioxane coating." According to Qi, in the crosslinking process, the silyl groups of the organosilane and the polymer (IVa) undergo hydrolysis to obtain hydroxysilyl groups. The hydroxysilyl groups condense with the hydroxysilyl groups on the silica particle surface to form siloxane (Si-O-Si) bonds. See col. 15, lines 53-62, and col. 16, lines 13-55. Qi further teaches at col. 15, lines 62-68, that "the incorporation of the silica particles into the overcoating layer can provide improved imaging member mechanical property, and the presence of silica particles also can enhance the crosslinking reaction during the fabrication of the overcoating layer." These properties appear to be the same properties achieved by using the colloidal silica recited in

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instant claims 16 and 54. Accordingly, it is reasonable to conclude that the Qi silica particles sold under the tradename AEROSIL 200 from Degussa are "colloidal" silica particles as recited in instant claims 16 and 54. The burden is on applicants to prove otherwise. Fitzgerald, supra.

Qi does not exemplify a silyl-functionalized hydroxyalkyl polymer obtained from a vinyl-containing monomer comprising a tertiary arylamine charge transport moiety as recited in instant claims 16 and 54, nor from the monomer di-p-anisylamino styrene (DAAS), applicants' elected species. However, Qi does not limit the type of vinyl-containing monomer comprising a hole transporting moiety. See col. 6, lines 6, 31, and 55-68.

Tamura discloses the monomer di-p-anisylamino styrene, which is representative of the Tamura formula (III). See Tamura, col. 3, lines 20-45, and col. 28, compound no. 124. Di-p-anisylamino styrene meets applicants' elected species. The monomer di-p-anisylamino styrene also meets the tertiary arylamine charge transport-containing monomer limitations recited in instant claims 16, 19, 28, 54, 65, and 74. See the chemical formula CTM I in claims 19 and 74. Tamura does not identify the di-p-anisylamino styrene as a vinyl-containing monomer comprising a hole transporting moiety. However, it is well known in the art of electrophotography that triarylamines

are hole transporting compounds. See Diamond, page 428, lines 26-29, and Fig. 9.22 at page 430. According to Tamura, polymerizable carbon-carbon double-bond-containing monomers of the formula (III) have a triphenylamine skeleton, which is "regarded as a hopping site of a charge carrier, so that they have excellent charge carrier transporting characteristics." Col. 3, lines 46-50.

Tamura also does not disclose that the di-p-anisylamino-phenyl moiety of the monomer has an oxidation potential as recited in instant claims 18 and 56. However, as discussed above, the di-p-anisylamino phenyl moiety meets the compositional limitations recited in instant claims 19 and 74. Kushibiki discloses that di-p-anisylamino benzene has an oxidation potential of 0.72 volts, which is within the range of about 0.6 to about 1.2 volts recited in instant claims 18 and 56. Kushibiki, col. 21, lines 15-20. Kushibiki does not disclose that the oxidation potential is "versus a standard calomel electrode" as recited in instant claims 18 and 56. However, because the di-p-anisylamino phenyl moiety meets the tertiary arylamine compositional limitations recited in claims 19 and 74 and because it has an oxidation potential value that is within the numerical value of the potential range recited in instant claims 18 and 56, it is reasonable to presume

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that the di-p-anisylamino phenyl moiety in the Tamara di-p-anisylamino styrene monomer has an oxidation potential as recited in instant claims 18 and 56. The burden is on applicants to prove otherwise. Fitzgerald, supra.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Qi and Tamura, to replace the vinylcarbazole monomer with the Tamura di-p-anisylamino styrene as the vinyl-containing monomer comprising a hole transporting moiety in the Qi silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) and to use the resultant polymer to form the overcoat layer in the photoconductive imaging member disclosed by Qi. That person would have had a reasonable expectation of successfully obtaining a crosslinked composite polysiloxane-silica that has excellent adhesion to a charge transport layer as disclosed by Qi and improved charge transporting characteristics as disclosed by Tamura; and an electrophotographic photoconductive imaging member having the benefits disclosed by Qi and Tamura.

Instant independent claims 16 and 54 are written in product-by-process format. Instant claims 16 and 54 recite that the silsesquioxane comprises the condensed reaction product of the charge transport polymer recited in those claims and from about 5 to 30 weight percent of "basic surface charge colloidal

silica" based on the weight of the silsesquioxane with optionally at least one additional silane monomer having at least one hydrolyzable group thereon. Qi does not disclose that its silica particles sold under the tradename AEROSIL 200 have a basic surface charge.

However, Qi teaches making the crosslinked composite polysiloxane-silica by the condensation method discussed supra in a mixture of ethanol/water. For the reasons discussed above, the silica particles sold under the trademark AEROSIL 200 are colloidal. The mixture of ethanol/water meets the solvent medium used in the condensation reaction recited in instant in instant claims 36-39 and 76-79. As discussed above, the combined teachings of Qi and Tamura render obvious a silyl and hole transporting moiety-containing polymer and a resultant crosslinked composite polysiloxane-silica that are within the compositional limitations of the charge transport polymer and the silsesquioxane, respectively, recited in the instant claims. As further discussed above, Qi teaches that in the crosslinking process, the silyl groups of the organosilane and the polymer (IVa) undergo hydrolysis to obtain hydroxysilyl groups. The hydroxysilyl groups condense with the hydroxysilyl groups on the silica particle surface to form siloxane (Si-O-Si) bonds. Furthermore, the originally filed specification at page 24,

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lines 17-20, discloses that "hydrolysis and condensation of silanes can be catalyzed by adding colloidal silica, i.e., silica particles that are stabilized by either an acidic or basic surface charge, and can influence the mechanical properties of the resulting silsesquioxane coating." As discussed above, according to Qi, "the incorporation of the silica particles into the overcoating layer can provide improved imaging member mechanical property, and the presence of silica particles also can enhance the crosslinking reaction during the fabrication of the overcoating layer." Qi teaches that a photoconductive imaging element comprising such an overcoat layer that comprises the crosslinked composite polysiloxane-silica has excellent mechanical wear resistance. These properties appear to be the same properties disclosed to be achieved by the use of the basic surface charge colloidal silica recited in instant claims 16 and 54. Thus, it appears that the crosslinked composite polysiloxane-silica rendered obvious over the combined teachings of the prior art is the same or substantially the same as the silsesquioxane made by the process limitations recited in the instant claims. The burden is on applicants to prove otherwise. In re Marosi, 218 USPQ 289 (Fed. Cir. 1983) and In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985).

8. Claims 16-25, 27-39, 54-62, 64-80, and 83-86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qi, as evidenced by (1) Applicants' admission I, (2) Oguchi, (3) Franz, (4) Beaurline, and (5) Vrancken; combined with Tamura, as evidenced by Diamond and Kushibiki.

Qi, as evidenced by Applicants' admission I, Oguchi, Franz, Beaurline, and Vrancken, discloses an electrophotographic photoconductive imaging member as described in paragraph 7 above, which is incorporated herein by reference. The crosslinked composite polysiloxane-silica is generated from the reaction of the silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) with an organosilane in a mixture of ethanol/water and silica particles. The polymer of formula (IV-a) is obtained by reacting 3-(trimethoxysilyl)-propylmethacrylate and a vinyl-containing monomer comprising a hole transporting moiety, e.g., vinylcarbazole.

Qi does not exemplify a silyl-functionalized hydroxyalkyl polymer obtained from a vinyl-containing monomer comprising a tertiary arylamine charge transport moiety as recited in instant claims 16 and 54.

However, Qi does not limit the type of vinyl-containing monomer comprising a hole transporting moiety. See col. 6,

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lines 6, 31, and 55-68. Qi teaches that the vinyl-containing monomer can be a monomer comprising an ester group. Col. 6, line 60.

Tamura discloses (meth)acrylate monomers comprising a triphenylamino moiety, which meet the triarylamine monomer limitations recited in instant claims 16, 19-21, 28, 54, 57, 58, 65, and 74. See Tamura, formula (II) at col. 3, lines 15 and 24-39, and, for example, compound nos. 114 and 116. See formula CTM-1 in claims 19 and 74. Tamura does not identify said (meth)acrylate monomers as monomers comprising a hole transporting moiety. However, it is well known in the art of electrophotography that triarylamines are hole transporting compounds. See Diamond, page 428, lines 26-29, and Fig. 9.22 at page 430. According to Tamura, polymerizable carbon-carbon double-bond-containing monomers of the formula (II) have a triphenylamine skeleton, which is "regarded as a hopping site of a charge carrier, so that they have excellent charge carrier transporting characteristics." Col. 3, lines 46-50.

Tamura also does not disclose that the triphenylamino moieties of the (meth)acrylate monomers have an oxidation potential as recited in instant claims 18 and 56. However, as discussed above, the triphenylamino moieties meet the compositional limitations recited in instant claims 19 and 74.

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Kushibiki discloses that the triphenylamino moiety in Tamura compound nos. 114 and 116 has an oxidation potential of 0.72 volts, which is within the range of about 0.6 to about 1.2 volts recited in instant claims 18 and 56. Kushibiki, col. 21, lines 15-20. Kushibiki does not disclose that the oxidation potential is "versus a standard calomel electrode" as recited in instant claims 18 and 56. However, because the triphenylamino moiety in Tamura compound nos. 114 and 116 meets the tertiary arylamine compositional limitations recited in claims 19 and 74 and because it has an oxidation potential value that is within the potential range recited in instant claims 18 and 56, it is reasonable to presume that the triphenylamino moiety in the Tamara compounds nos. 114 and 116 has an oxidation potential as recited in instant claims 18 and 56. The burden is on applicants to prove otherwise. Fitzgerald, supra.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Qi and Tamura, to replace the vinylcarbazole monomer with the Tamura (meth)acrylate monomer comprising a triphenylamine moiety as the vinyl-containing monomer comprising a hole transporting moiety in the Qi silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) and to use the resultant polymer to form the overcoat layer of the imaging member disclosed by Qi. That

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person would have had a reasonable expectation of successfully obtaining a crosslinked composite polysiloxane-silica that has excellent adhesion to a charge transport layer as disclosed by Qi and improved charge transporting characteristics as disclosed by Tamura; and an electrophotographic imaging member having the benefits disclosed by Qi and Tamura.

Instant independent claims 16 and 54 are written in product-by-process format as described in paragraph 7 above. Qi does not teach that its silica particles sold under the tradename AEROSIL 200 have a basic surface charge. However, for the reasons discussed in paragraph 7 above, the silica particles sold under the trademark AEROSIL 200 are colloidal. As discussed above, the combined teachings of Qi and Tamura render obvious a silyl and hole transporting moiety-containing polymer and a resultant crosslinked composite polysiloxane-silica that are within the compositional limitations of the charge transport polymer and the silsesquioxane, respectively, recited in the instant claims. For the reasons discussed in paragraph 7 above, which are incorporated herein by reference, it appears that the crosslinked composite polysiloxane-silica rendered obvious over the combined teachings of the prior art is the same or substantially the same as the silsesquioxane made by the process limitations recited in the instant claims. The burden is on

applicants to prove otherwise. Marosi, supra, and Thorpe, supra. MPEP 2113.

9. Applicants' arguments filed on Jul. 16, 2007, as applicable to the rejections over Qi in paragraphs 7 and 8 above have been fully considered but they are not persuasive.

Applicants assert that the Qi silica particles sold under the tradename AEROSIL 200 are not colloidal, but are fumed silica, which has an acid surface charge and is not soluble in water or solvents. Applicants further assert that "[w]hile fumed silica is a white powder, colloidal silica is only obtainable as an aqueous sol. No milling is required to disperse the silica as taught in Qi." Applicants assert that the basic charge colloidal silica particles recited in the instant claims are negative in charge so that they repel each other to form a stable sol. Applicants assert that because the AEROSIL 200 silica used in Qi has a pH of about 4, it will not catalyze the sol-gel condensation reaction (curing) because "it does not carry with it the basic charge carriers ( $\text{Na}_2\text{O}$ ) that basic surface charge colloidal silica has associated with it." Applicants assert that siloxane condensation reaction recited in the instant claims is base catalyzed, "resulting in a much higher degree of condensation of the silsesquioxane."

Applicants assert that the cross-linked composite product rendered obvious over the combined teachings in Qi and Tamura is different from the condensation product recited in the instant claims.

Applicants' assertions are not persuasive. According to Grant & Hachk's Chemical Dictionary, fifth edition, page 145, the term "colloid" is broadly defined as "[a] state of subdivision of matter which comprises either single large molecules (*molecular c.*; as, proteins) or aggregation of smaller molecules (*association c.*; as, gold). The particles of ultramicroscopic size (*dispersed phase*) are surrounded by a different matter (*dispersion medium* or *external phase*)."<sup>1</sup> The list of colloidal systems presented in Table 18 at page 145 in Grant & Hachk's include solid in liquid (hydrosols) and solid in gas (aerosols) systems. As noted in paragraph 7 above, according to Oguchi, which is drawn to electrophotographic photosensitive members, "[h]itherto used colloidal silica involve aqueous sols using water as a dispersion medium and aerosols using air as a dispersion medium."<sup>2</sup> Thus, it appears that the term "colloidal silica" given its broadest meaning includes aqueous dispersions of silica particles and fumed silica. As discussed in paragraph 7, the prior art identifies silica particles associated with the tradename AEROSIL 200 from

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Degussa as a "colloidal silica." Franz discloses that fumed silica particles, such as the commercially available AEROSIL 200 from Degussa, are "colloidal in nature." See also the cited disclosures in Vrancken and in Beaurline. Thus, the preponderance of evidence in the prior art indicates that the Qi silica particles sold under the trademark AEROSIL 200 are "colloidal" as recited in instant claims 16 and 54.

(The examiner notes that applicants' reliance on references "Technical Bulletin Fine Particles, Number 11 . . ." and "Properties, Uses, Storage and Handing LUDOX . . ." to support their assertions are not probative because the information contained in those references have not been considered for the reasons discussed in the Advisory action mailed on Jul. 30, 2007, paragraph 1. In addition, applicants' reliance on pages 319-323 of the reference to "Iller" is not probative, because applicants did not provide copies of said pages, but only provided copies of pages 331 and 337.)

Furthermore, applicants' assertions that the crosslinked product rendered obvious over the combined teachings of Qi and Tamura is different from the condensation product recited in the instant claims are not persuasive. As noted in paragraphs 7 and 8 above, the silsesquioxane recited in the instant claims is written in product-by-process format. Applicants have not

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provided any credible evidence to show that the crosslinked composite polysiloxane-silica rendered obvious over the combined teachings of Qi and Tamura differ from the silsesquioxane obtained by the process limitations recited in the instant claims.

As discussed in paragraphs 7 and 8, the combined teachings of Qi and Tamura render obvious a silyl and hole transporting moiety-containing polymer and a resultant crosslinked composite polysiloxane-silica that are within the compositional limitations of the charge transport polymer and the silsesquioxane, respectively, recited in the instant claims. Instant claims 16 and 54 do not exclude the optional silane monomer from being 3-aminopropyl-trimethoxysilane.

In addition, as discussed in paragraphs 7 and 8, Qi teaches that the crosslinked composite polysiloxane-silica is obtained by condensing the hydroxysilyl groups (silanol groups) on the surface of the silica particles with the hydroxysilyl groups in the polymer (IVa) and organosilane compound. Qi teaches that "the incorporation of the silica particles into the overcoating layer can provide improved imaging member mechanical property, and the presence of silica particles also can enhance the crosslinking reaction during the fabrication of the overcoating layer." As noted in paragraphs 7 and 8, these properties appear

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to be the same properties disclosed to be achieved by the use of the basic surface charge colloidal silica recited in instant claims 16 and 54. See the originally filed specification at page 24, lines 17-20, which discloses that the "hydrolysis and condensation of silanes can be catalyzed by adding colloidal silica, i.e., silica particles that are stabilized by either an acidic or basic surface charge, and can influence the mechanical properties of the resulting silsesquioxane coating."

Applicants' own disclosure at page 24 of the originally filed specification indicates that the colloidal silica can have either a basic or an acidic charge on its surface to form the silsesquioxane condensation product, which is in marked contrast to applicants' current assertions. The instant specification is far more reliable than arguments presented without an evidentiary foundation - especially when the arguments contradict the teachings in the specification.

Furthermore, applicants cannot argue patentability based on limitations that are not present in the claims. The instant claims do not require that the basic surface charge colloidal silica have Na<sub>2</sub>O present on it surface. Nor do the claims require the presence of acetic acid to react with the Na<sub>2</sub>O in the colloidal silica to from sodium acetate, which is used as a condensation catalyst.

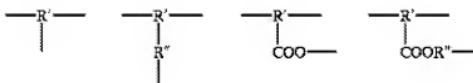
Moreover, there appears to be no disclosure in the originally filed specification to support applicants' assertion that base catalyzed siloxane condensation reactions result in "a much higher degree of condensation of the silsesquioxane." As noted above, the disclosure at page 24, lines 17-20, states that the hydrolysis and condensation of silanes can be catalyzed by either acidic or basic surface charged silica particles. In instant examples 12-52, the originally filed specification describes the silsesquioxanes used in those examples, which are obtained by using colloidal silica sold under the trademark LUDOX LS, as sol gels "catalyzed by acetic acid." The colloidal silica sold under the trademark LUDOX LS is described at page 24, lines 22-23, of the specification, as a "colloidal silica stabilized with a small amount of sodium salt of silanol." In addition, the hydrolysis and condensation general scheme shown at page 40 in the instant examples is the same scheme shown at page 24 of the specification that is described to represent the "hydrolysis and condensation of silane compounds (sol-gels) by acid catalysis to form silsesquioxanes" (emphasis added). See the originally filed specification, paragraph bridging pages 23 and 24. Applicants have not indicated where in the originally filed specification there is any credible evidence to support their assertion.

Accordingly, applicants have not met their burden to show that the crosslinked composite polysiloxane-silica rendered obvious over the combined teachings of the prior art is not the same or substantially the same as the silsesquioxane made by the process limitations recited in the instant claims.

Applicants further assert that Qi does not suggest that the hole transporting moiety in the vinyl-containing monomer comprising the hole transport moiety is attached to a divalent bridging moiety as required in instant claims 16 and 54. Applicants assert that Qi teaches away from the present invention in that the transport material is bonded to the polymer backbone through a nitrogen atom because Qi only exemplifies polymers comprising vinyl carbazole. Applicants also assert that Tamura teaches away from using its vinyl-containing monomers comprising a charge transporting moiety, e.g., di-p-anisylamino styrene, in forming silsesquioxanes.

Applicants' assertions are not persuasive. As noted in the rejections in paragraphs 7 and 8 above, Qi teaches that the exemplified vinyl carbazole monomer in its silyl-functionalized hydroxalkyl polymer can be replaced with other monomers comprising a hole transporting moiety. See, for example, the rejections in paragraph 7, page 12, first full paragraph, and in paragraph 8, the paragraph bridging pages 17 and 18, which cite

the teachings in Qi at col. 6, lines 6, 31, and 55-68. Qi at col. 6, lines 6 and 31, teaches that in its polymer formula, "E" is "a hole transporting moiety." Qi at col. 6, lines 55-68, teaches that "D", which is bonded to "E" and is part of the backbone of the vinyl polymer can be one of the following groups



where R' and R" are independently trivalent linkages and divalent linkages of, for example, from about 2 to about 24 carbon atoms. Thus, Qi teaches that the vinylcarbazole monomer in its exemplified polymer (IV-a) in example VI can be replaced with other the vinyl-containing monomers comprising a hole transporting moiety, such as those where the hole transporting moiety is attached to the vinyl polymer backbone itself or through the linking group -R"—, -COO-, or -COOR"—. The disclosure of a reference is not limited to its examples or to its preferred embodiments. Rather, a reference is relevant for all that it teaches. In re Heck, 216 USPQ 1038, 1039 (Fed. Cir. 1983). "[I]n a section 103 inquiry, 'the fact that a specific [embodiment] is taught to be preferred is not controlling, since all disclosures of the prior art, including unpreferred embodiments, must be considered.'" Merck & Co. Inc.

v. Biocraft Laboratories Inc., 10 USPQ2d 1843, 1846 (Fed. Cir. 1989) (quoting In re Lamberti, 192 USPQ 278, 280 (CCPA 1976)).

Accordingly, contrary to applicants, Qi does not teach away from charge transport polymers comprising a vinyl-containing monomer comprising a tertiary arylamine charge transporting moiety with or without the presence of the linking group "X," as required in the instant claims 16 and 54.

Furthermore, applicants' assertions regarding Tamura are also not persuasive. Tamura is cited to show that vinyl-containing monomers comprising hole transporting moieties that are within the teachings of Qi and within the scope of the instant claims are well known in the art. For the reasons discussed in the rejections in paragraphs 7 and 8, in view of the teachings of Qi and Tamura, the combined teachings of Qi and Tamura render obvious the charge transport polymer recited in the instant claims.

Accordingly, the rejections in paragraphs 7 and 8 stand.

10. Claims 81 and 82 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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The prior art of record does not teach or suggest the electrophotographic element recited in claims 81 and 82. Qi does not teach or suggest that its charge transport layer in the electrophotographic imaging member, which is located between the charge generating layer and the overcoat layer, can comprise the crosslinked composite polysiloxane-silica or the silyl-functionalized hydroxyalkyl polymer comprising the hole-transporting moieties.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Mark Huff, can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry regarding papers not received regarding this communication or earlier communications should be directed to Supervisory Application Examiner Ms. Sandra Sewell, whose telephone number is (571) 272-1047.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Janis L. Dote/  
Primary Examiner, Art Unit 1795

JLD  
Jan. 29, 2009